

IV. CONCLUSIONS

The cooling enhancement of ribbed wall using different fluids is simulated in this paper. The conclusions are as follows:

- SST turbulence model is performed on 90deg ribbed duct. The numerical results are compared with the experimental data from Tanda [6]. It is suggested that the SST turbulence model could provide acceptable engineering accuracy to analyze the flow and heat transfer feature in the 90 deg ribbed duct.
- For all coolant fluids the wall trapezoidal shaped ribs have highest heat transfer coefficient. So it is better ribs design in internal flow.
- Wall with square shaped ribs using air/mist, steam and steam/mist as coolants save 14%, 54% and 104%, respectively compared to air to achieve the same cooling effect. Also trapezoidal shaped ribs save 9%, 16%, 68% and 118% respectively, for air, air/mist, steam and steam/mist compared with air in square ribs case.

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